## SPEC CPU®2017 Floating Point Rate Result

**Fujitsu**

PRIMERGY RX2450 M1, AMD EPYC 72F3

3.70 GHz

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Software Availability:** Mar-2021  
**Test Date:** Oct-2021  

### SPECrate®2017_fp_base

<table>
<thead>
<tr>
<th>Copy</th>
<th>SPECrate®2017_fp_base (246)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>32</td>
</tr>
<tr>
<td>120</td>
<td>209</td>
</tr>
<tr>
<td>240</td>
<td>243</td>
</tr>
<tr>
<td>360</td>
<td>137</td>
</tr>
<tr>
<td>480</td>
<td>256</td>
</tr>
<tr>
<td>600</td>
<td>185</td>
</tr>
<tr>
<td>720</td>
<td>314</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU Name:** AMD EPYC 72F3  
- **Max MHz:** 4100  
- **Nominal:** 3700  
- **Enabled:** 16 cores, 2 chips, 2 threads/core  
- **Orderable:** 2 chips  
- **Cache L1:** 32 KB I + 32 KB D on chip per core  
- **Cache L2:** 512 KB I+D on chip per core  
- **Cache L3:** 256 MB I+D on chip per chip, 32 MB per core  
- **Memory:** 2 TB (32 x 64 GB 2Rx4 PC4-3200V-L)  
- **Storage:** 1 x PCIe SSD, 2TB  

### Software

- **OS:** SUSE Linux Enterprise Server 15 SP2 (x86_64)  
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC  
- **Firmware:** Fujitsu BIOS Version 2.1.V2 Released Oct-2021  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** Not Applicable  
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

SPECrate®2017_fp_base = 246

SPECrate®2017_fp_peak = Not Run

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>32</td>
<td>419</td>
<td>767</td>
<td>416</td>
<td>771</td>
<td>417</td>
<td>770</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>32</td>
<td>129</td>
<td>314</td>
<td>129</td>
<td>314</td>
<td>130</td>
<td>313</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>508.namd_r</td>
<td>32</td>
<td>240</td>
<td>127</td>
<td>240</td>
<td>127</td>
<td>240</td>
<td>127</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>510.parest_r</td>
<td>32</td>
<td>327</td>
<td>256</td>
<td>326</td>
<td>256</td>
<td>329</td>
<td>254</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>511.povray_r</td>
<td>32</td>
<td>404</td>
<td>185</td>
<td>406</td>
<td>184</td>
<td>404</td>
<td>185</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>32</td>
<td>245</td>
<td>137</td>
<td>243</td>
<td>139</td>
<td>246</td>
<td>137</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>32</td>
<td>297</td>
<td>242</td>
<td>296</td>
<td>243</td>
<td>295</td>
<td>243</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>526.blender_r</td>
<td>32</td>
<td>233</td>
<td>209</td>
<td>233</td>
<td>209</td>
<td>232</td>
<td>210</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>32</td>
<td>292</td>
<td>191</td>
<td>291</td>
<td>192</td>
<td>289</td>
<td>193</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>32</td>
<td>116</td>
<td>687</td>
<td>116</td>
<td>687</td>
<td>116</td>
<td>687</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>544.nab_r</td>
<td>32</td>
<td>224</td>
<td>240</td>
<td>224</td>
<td>240</td>
<td>224</td>
<td>241</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>32</td>
<td>555</td>
<td>225</td>
<td>559</td>
<td>223</td>
<td>556</td>
<td>224</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>554.roms_r</td>
<td>32</td>
<td>300</td>
<td>170</td>
<td>302</td>
<td>168</td>
<td>303</td>
<td>168</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

The AMD64 AOCC Compiler Suite is available at
http://developer.amd.com/amd-aocc/

Submit Notes

The config file option 'submit' was used.

'numactl' was used to bind copies to the cores.

See the configuration file for details.

Operating System Notes

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit

runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
Operating System Notes (Continued)

'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

To enable Transparent Hugepages (THP) for all allocations, 'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and 'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = 
"/home/benchmark/speccpu-milan/amd_rate_aocc300_milan_B_lib/lib;/home/benchmark/speccpu-milan/amd_rate_aocc300_milan_B_lib/lib32:" 
MALLOC_CONF = "retain:true"

General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using OpenSUSE 15.2

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.2.0 is available here: https://github.com/jemalloc/jemalloc/releases/download/5.2.0/jemalloc-5.2.0.tar.bz2

Platform Notes

BIOS configuration:
ACPI SRAT L3 Cache As NUMA Domain = Enabled
APBDIS = 1
cTDP Control = Manual
cTDP = 200
Determinism Slider = Power
DRAM Scrub Time = Disabled
EDC Control = Manual

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

SPECrate®2017_fp_base = 246
SPECrate®2017_fp_peak = Not Run

Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Oct-2021
Hardware Availability: Oct-2021
Software Availability: Mar-2021

EDC = 300
EDC Platform Limit = 300
Fix SOC P-state = P0
IOMMU = Disabled
L1 Stream HW Prefetcher = Enabled
L2 Stream HW Prefetcher = Enabled
NUMA Nodes Per Socket = NPS4
Package Power Limit = 200
Package Power Limit Control = Manual
SVM Mode = Disabled
SMT Control = Enabled
xGMI Link Max Speed = 18Gbps

Sysinfo program /home/benchmark/speccpu-milan/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acac64d
running on localhost Fri Aug 6 04:18:57 2021

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : AMD EPYC 72F3 8-Core Processor
  2 "physical id"s (chips)
  32 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
cpu cores : 8
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: cores 0 1 2 3 4 5 6 7

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 16
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 72F3 8-Core Processor

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Fujitsu

PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

SPECrater®2017_fp_base = 246
SPECrater®2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Platform Notes (Continued)

Stepping: 1
CPU MHz: 1799.214
CPU max MHz: 3700.0000
CPU min MHz: 1500.0000
BogoMIPS: 7400.22
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0,16
NUMA node1 CPU(s): 1,17
NUMA node2 CPU(s): 2,18
NUMA node3 CPU(s): 3,19
NUMA node4 CPU(s): 4,20
NUMA node5 CPU(s): 5,21
NUMA node6 CPU(s): 6,22
NUMA node7 CPU(s): 7,23
NUMA node8 CPU(s): 8,24
NUMA node9 CPU(s): 9,25
NUMA node10 CPU(s): 10,26
NUMA node11 CPU(s): 11,27
NUMA node12 CPU(s): 12,28
NUMA node13 CPU(s): 13,29
NUMA node14 CPU(s): 14,30
NUMA node15 CPU(s): 15,31
Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperfmperf pni pclmulqdq
monitor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osw ibs skinit wdt tce topoext perfctr_core perfctr_nb bext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase bm1 avx2 smep bmi2 erms invpcid cmqm rdts_a rdsen_adv smap clflushopt clwb sha ni xsaveopt xsavec xgetbv1 xsavec cmqm_llc cmqm_occup_llc cmqm_mbm_total cmqm_mbm_local clzero irperf xsaveerpr wbnoinvd arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean flushbyasid decodeassists pausefilter pfthreshold v_vmsave_vmload vgic umip pkq ospke vaes vpclmulqdq rdpid overflow_recov succor smca

From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 16 nodes (0-15)
node 0 cpus: 0 16
node 0 size: 128758 MB

(Continued on next page)
# SPEC CPU®2017 Floating Point Rate Result

## Fujitsu

**PRIMERGY RX2450 M1, AMD EPYC 72F3**

### 3.70 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>246</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Oct-2021  
**Hardware Availability:** Oct-2021  
**Software Availability:** Mar-2021

---

### Platform Notes (Continued)

```plaintext
node 0 free: 128659 MB
node 1 cpus: 1 17
node 1 size: 129021 MB
node 1 free: 128948 MB
node 2 cpus: 2 18
node 2 size: 129023 MB
node 2 free: 128951 MB
node 3 cpus: 3 19
node 3 size: 129021 MB
node 3 free: 128953 MB
node 4 cpus: 4 20
node 4 size: 129023 MB
node 4 free: 128944 MB
node 5 cpus: 5 21
node 5 size: 129021 MB
node 5 free: 128934 MB
node 6 cpus: 6 22
node 6 size: 129023 MB
node 6 free: 128927 MB
node 7 cpus: 7 23
node 7 size: 129009 MB
node 7 free: 128728 MB
node 8 cpus: 8 24
node 8 size: 129023 MB
node 8 free: 128949 MB
node 9 cpus: 9 25
node 9 size: 129021 MB
node 9 free: 128956 MB
node 10 cpus: 10 26
node 10 size: 129023 MB
node 10 free: 128947 MB
node 11 cpus: 11 27
node 11 size: 128987 MB
node 11 free: 128905 MB
node 12 cpus: 12 28
node 12 size: 129023 MB
node 12 free: 128937 MB
node 13 cpus: 13 29
node 13 size: 129021 MB
node 13 free: 128942 MB
node 14 cpus: 14 30
node 14 size: 129023 MB
node 14 free: 128929 MB
node 15 cpus: 15 31
node 15 size: 128781 MB
node 15 free: 128693 MB
node distances:
```

(Continued on next page)
Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

 SPEC CPU®2017 Floating Point Rate Result

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

SPECRate®2017_fp_base = 246
SPECRate®2017_fp_peak = Not Run

Platform Notes (Continued)


From /proc/meminfo
MemTotal: 2113335624 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release* /etc/*version*
os-release:
NAME="SLES"
VERSION="15-SP2"
VERSION_ID="15.2"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020
(720aeba/lp-1a956f1) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected

(Continued on next page)
**SPEC CPU®2017 Floating Point Rate Result**

**Platform Notes (Continued)**

- **CVE-2018-3639 (Speculative Store Bypass):**
  - Mitigation: Speculative Store Bypass disabled via prctl and seccomp

- **CVE-2017-5753 (Spectre variant 1):**
  - Mitigation: usercopy/swapgs barriers and __user pointer sanitization

- **CVE-2017-5715 (Spectre variant 2):**
  - Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling

- **CVE-2020-0543 (Special Register Buffer Data Sampling):** Not affected
- **CVE-2019-11135 (TSX Asynchronous Abort):** Not affected

---

**Compiler Version Notes**

```
C | 519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
```

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu

---

**Fujitsu**

PRIMERGY RX2450 M1, AMD EPYC 72F3

3.70 GHz

---

**Fujitsu**

PRIMERGY RX2450 M1, AMD EPYC 72F3

3.70 GHz

---

**SPECrater®2017_fp_base = 246**

SPECrater®2017_fp_peak = Not Run

---

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

** Tested by:** Fujitsu

**Test Date:** Oct-2021

**Hardware Availability:** Oct-2021

**Software Availability:** Mar-2021
Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

CPU2017 License: 19
Test Sponsor: Fujitsu
Test Date: Oct-2021
Tested by: Fujitsu
Hardware Availability: Oct-2021
Software Availability: Mar-2021

SPECrater®2017_fp_base = 246
SPECrater®2017_fp_peak = Not Run

Compiler Version Notes (Continued)

Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C++           | 508.namd_r(base) 510.parest_r(base)
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C++, C         | 511.povray_r(base) 526.blender_r(base)
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
C++, C, Fortran | 507.cactuBSSN_r(base)
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

(Continued on next page)
### Fujitsu

PRIMERGY RX2450 M1, AMD EPYC 72F3 3.70 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>246</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Oct-2021  
**Hardware Availability:** Oct-2021  
**Software Availability:** Mar-2021

---

### Compiler Version Notes (Continued)

```
Fortran         | 503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)  
-----------------|-------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
```

```
Fortran, C      | 521.wrf_r(base) 527.cam4_r(base)  
----------------|--------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
```

### Base Compiler Invocation

**C benchmarks:**  
`clang`

**C++ benchmarks:**  
`clang++`

**Fortran benchmarks:**  
`flang`

**Benchmarks using both Fortran and C:**  
`flang clang`

**Benchmarks using both C and C++:**  
`clang++ clang`

**Benchmarks using Fortran, C, and C++:**  
`clang++ clang flang`
**SPEC CPU®2017 Floating Point Rate Result**

**Fujitsu**

PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
<th>246</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

CPU2017 License: 19  
Test Sponsor: Fujitsu  
Tested by: Fujitsu  

**Test Date:** Oct-2021  
**Hardware Availability:** Oct-2021  
**Software Availability:** Mar-2021

---

### Base Portability Flags

<table>
<thead>
<tr>
<th>Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>519.ibm_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>521.wrf</td>
<td>-DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>-funsigned-char -D__BOOL_DEFINED -DSPEC_LP64</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>-DSPEC_CASE_FLAG -DSPEC_LP64</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>-DSPEC_LP64</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>-DSPEC_LP64</td>
</tr>
</tbody>
</table>

---

### Base Optimization Flags

**C benchmarks:**

- `-m64`  
- `-flto`  
- `-Wl,-mllvm -Wl,-region-vectorize`  
- `-Wl,-mllvm -Wl,-function-specialize`  
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`  
- `-Wl,-mllvm -Wl,-reduce-array-computations=3`  
- `-O3 -ffast-math`  
- `-march=znver3`  
- `-fveclib=AMDLIBM -fstruct-layout=5`  
- `-mlvm -unroll-threshold=50 -mlvm -inline-threshold=1000`  
- `-freemap-arrays -mlvm -function-specialize -flv-function-specialization`  
- `-mlvm -enable-gvn-hoist -mlvm -global-vectorize-slp=true`  
- `-mlvm -enable-licm-vrp -mlvm -reduce-array-computations=3`  
- `-z muldefs`  
- `-lflangrti`  
- `-lflang -lflangrti`  

**C++ benchmarks:**

- `-m64`  
- `-std=c++98`  
- `-mno-adx`  
- `-mno-sse4a`  
- `-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto`  
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize`  
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`  
- `-Wl,-mllvm -Wl,-reduce-array-computations=3`  
- `-O3 -ffast-math`  
- `-march=znver3`  
- `-fveclib=AMDLIBM -mlvm -enable-partial-unswitch`  
- `-mlvm -unroll-threshold=100 -finline-aggressive`  
- `-flv-function-specialization -mlvm -loop-unswitch-threshold=200000`  
- `-mlvm -rerolloops -mlvvm -agressive-loop-unswitch`  
- `-mlvm -extra-vectorizer-passes -mlvvm -reduce-array-computations=3`  
- `-mlvm -global-vectorize-slp=true -mlvm -convert-pow-exp-to-int=false`  
- `-z muldefs`  
- `-lflangrti`  

**Fortran benchmarks:**

- `-m64`  
- `-Wl,-mllvm -Wl,-enable-X86-prefetching`
**Base Optimization Flags (Continued)**

Fortran benchmarks (continued):
- `-Wl,-mllvm -Wl,-enable-licm-vrp -flto -Wl,-mllvm -Wl,-region-vectorize`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -Hz,1,0x1 -O3 -ffast-math`
- `-march=znver3 -fveclib=AMDLIBM -Kieee -Mrecursive`
- `-mllvm -fuse-tile-inner-loop -funroll-loops`
- `-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3`
- `-mllvm -global-vectorize-slp=true -z muldefs -lamdlibm -ljemalloc -lflang -lflangrti`

Benchmarks using both Fortran and C:
- `-m64 -Wl,-mllvm -Wl,-enable-X86-prefetching`
- `-Wl,-mllvm -Wl,-enable-licm-vrp -flto -Wl,-mllvm -Wl,-region-vectorize`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5`
- `-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000`
- `-fremap-arrays -mllvm -function-specialize -flv-function-specialization`
- `-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -Hz,1,0x1`
- `-Kieee -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops`
- `-mllvm -extra-vectorizer-passes -mllvm -lsr-in-nested-loop -z muldefs`
- `-lamdlibm -ljemalloc -lflang -lflangrti`

Benchmarks using both C and C++:
- `-m64 -std=c++98 -mno-adx -mno-sse4a`
- `-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math`
- `-march=znver3 -fveclib=AMDLIBM -fstruct-layout=5`
- `-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000`
- `-fremap-arrays -mllvm -function-specialize -flv-function-specialization`
- `-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3`
- `-mllvm -enable-partial-unswitch -mllvm -unroll-threshold=100`
- `-finline-aggressive -mllvm -loop-unswitch-threshold=200000`
- `-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch`
- `-mllvm -extra-vectorizer-passes -mllvm -convert-pow-exp-to-int=false`
- `-z muldefs -lamdlibm -ljemalloc -lflang -lflangrti`

Benchmarks using Fortran, C, and C++:
- `-m64 -std=c++98 -mno-adx -mno-sse4a`

(Continued on next page)
Fujitsu
PRIMERGY RX2450 M1, AMD EPYC 72F3
3.70 GHz

SPECRate®2017_fp_base = 246
SPECRate®2017_fp_peak = Not Run

Base Optimization Flags (Continued)

Benchmarks using Fortran, C, and C++ (continued):
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -flto
-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallback-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
-march=zvner3 -fveclib=AMDLIBM -fstruct-layout=5
-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
-fremap-arrays -mlir -function-specialize -flv-function-specialization
-mlir -enable-gvn-hoist -mlir -global-vectorize-slp=true
-mlir -enable-licm-vrp -mlir -reduce-array-computations=3
-mlir -enable-partial-unswitch -mlir -unroll-threshold=100
-finline-aggressive -mlir -loop-unswitch-threshold=200000
-mlir -reroll-loops -mlir -aggressive-loop-unswitch
-mlir -extra-vectorizer-passes -mlir -convert-pow-exp-to-int=false
-Hz,1,0x1 -Kieee -Mrecursive -mlir -fuse-tile-outer-loop
-funroll-loops -mlir -lsr-in-nested-loop -z muldefs -lamdlibm
-ljemalloc -lflang -lflangrti

Base Other Flags

C benchmarks:
-Wno-unused-command-line-argument

C++ benchmarks:
-Wno-unused-command-line-argument

Fortran benchmarks:
-Wno-unused-command-line-argument

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument

Benchmarks using both C and C++:
-Wno-unused-command-line-argument

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument

The flags files that were used to format this result can be browsed at
<table>
<thead>
<tr>
<th>SPEC CPU®2017 Floating Point Rate Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fujitsu</strong></td>
</tr>
<tr>
<td>PRIMERGY RX2450 M1, AMD EPYC 72F3</td>
</tr>
<tr>
<td>3.70 GHz</td>
</tr>
<tr>
<td>SPECrate®2017_fp_base = 246</td>
</tr>
<tr>
<td>SPECrate®2017_fp_peak = Not Run</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CPU2017 License: 19</th>
<th>Test Date: Oct-2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor: Fujitsu</td>
<td></td>
</tr>
<tr>
<td>Tested by: Fujitsu</td>
<td></td>
</tr>
<tr>
<td>Hardware Availability: Oct-2021</td>
<td></td>
</tr>
<tr>
<td>Software Availability: Mar-2021</td>
<td></td>
</tr>
</tbody>
</table>

You can also download the XML flags sources by saving the following links:

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.8 on 2021-08-05 15:18:57-0400.
Originally published on 2021-11-23.